

REMARKS

As an initial matter, it is noted that there are two Driskill-Smith references, both being Applied Physics Letters, one from vol. 71, and one from vol. 75 as set forth on the IDS filed on June 13, 2003. However, the PTO-892 attached to the January 15, 2003 office action lists reference U with the titles and volume numbers interchanged.

The Office Action rejects claims 1-18, 23-25 and 27-39 under 35 U.S.C. § 103 over Driskill-Smith in view of Jin (USP 6,283,812). This rejection is respectfully traversed.

It is respectfully asserted that the Office Action is using impermissible hindsight consideration of the application to reconstruct the claimed invention, where the references provide no motivation for the asserted combination. In fact, the Office Action ignores portions of the references that suggest that one of ordinary skill in the art would not make such a combination, as further explained below.

The Office Action asserts that it would be obvious to configure the source taught by Driskill-Smith adjacent the anode of a flat panel that receives the flux of charge carriers from the source as taught by Jin. This assertion is respectfully traversed. Specifically, Driskill-Smith is a nanoscale field emission structure used in vacuum microelectronics. Driskill-Smith includes nanopillar tips where field emitted electrons travel from the nanopillar tips to the extractor electrodes.

It is respectfully submitted that if one were to modify the field emission structure of Driskill-Smith to include an anode as taught by Jin that the field emission structure of Driskill-Smith would not function for its intended purpose if the electrodes were to travel from the nanopillar to the adjacent anode of Jin. To function properly, the microfabricated field emission device for vacuum microelectronics of Driskill-Smith must have the electrons travel from the nanopillar to be collected by the extractor electrode, and the suggested modification would prevent this from occurring.

Thus it is asserted that one of skill in the art would not have modified the field emission structure of Driskill-Smith as suggested in the Office Action. It is submitted that the only motivation present for such a modification is improper hindsight consideration of Applicant's disclosure, using Applicants teachings as a roadmap to pick and choose elements from the prior art in an attempt to reconstruct the claimed invention. Accordingly, it is submitted that claim 1 and all claims dependent therefrom would not have been obvious over the applied references. Accordingly, claims 1-18 and 23-25 would not have been obvious

over Driskill-Smith in view of Jin.

In response to this argument, in paragraph 3 of the Office Action, the Examiner asserts “The examiner notes that in claim 9 the applicant claims adding a positive bias to the specimen. This is equivalent to the anode of Jin.” It is submitted that this assertion by the Examiner is a further indication that the Examiner is engaging in impermissible hindsight reconstruction of the claimed invention. It is submitted that it is improper for the Examiner to look to claim 9 of the application to justify why it would be obvious to combine the references to reject claim 1. The fact that applicants claim adding a positive bias to the specimen is irrelevant in determining whether it would be obvious to combine the teachings of the applied references, and does not obviate the fact that Driskill-Smith would not function for its intended purpose if modified as suggested.

In paragraph 3 of the Office Action, the Examiner asserts that Jin provides the motivation for the asserted modification at col. 12, lines 34-38, also referring to Fig. 11. Applicants fail to understand how this portion of Jin provides any motivation, as it merely describes structural elements of Jin. Applicants request that the Examiner specifically explain how the electrons of Driskill-Smith could be collected by the extractor electrode if modified as suggested.

Further, the device of Driskill-Smith was “tested in air at atmospheric pressure” (see page 3160, left hand column) whereas flat panel displays contain elements in a vacuum seal. In a flat panel display, the bias applied between the cathode and anode is typically several hundreds of volts. Thus, if the device of Driskill-Smith were to be provided with a specimen as taught by Jin it would not work because the air would be ionized. Thus, one of ordinary skill in the art would not modify driskill-Smith as suggested in the Office Action.

Regarding claim 27, claim 27 is not obvious for the same reasons discussed above regarding claim 1. In particular, one of skill in the art would not take the anode of Jin and combine it with the field emission structure of Driskill-Smith, as explained above. Furthermore, even if such a modification of Driskill-Smith were possible and would allow the field emission structure of Driskill-Smith to function for its intended purpose (which it would not) it is submitted that one of ordinary skill in the art would not consider providing an anode and field emission structure in a near-field configuration. Jin makes no mention of near-field electron optics. Further, the display of Jin does not require near-field configuration and electron coherence in order to operate. Thus, there is no motivation for a person of ordinary

skill in the art to go to the length to configure the emitter and specimen in the near fields. Accordingly, claim 27 and dependent claims 28-31 would not have been obvious over the applied references.

Regarding claims 32 and 36, it is submitted that these claims are not obvious for the same reasons given above regarding claim 1. In particular, one of ordinary skill in the art would not combine the anode of Jin with the field emission structure of Driskill-Smith for the reasons given above. Accordingly, claims 32 and 36, and dependent claims 33-35 and 37-38 would not have been obvious over the applied references. Withdrawal of the rejection is requested.

The Office Action rejects claims 20 and 26 under 35 U.S.C. § 103 over Driskill-Smith in view of Jin and further in view of Chang (USP 5,122,663). This rejection is respectfully traversed.

Regarding claim 20, it is submitted that Chang does not solve the above-noted deficiencies of the other cited references regarding claim 1 from which claim 20 is dependent. Accordingly, claim 20 also would not have been obvious over the applied references. Further, it is submitted that one of ordinary skill in the art would not consider combining Driskill-Smith, Jin and Chang. In particular, Jin and Chang are used for different applications. Jin shows a display in Fig. 11, whereas Chang is concerned with electron microscope. There is no reason why a person of skill in the art would want to provide a collector as taught by Chang to modify a display as taught by Jin or to modify the field emission structure used in vacuum microelectronics as taught by Driskill-Smith.

Regarding claim 26, this claim is not obvious over the applied references because of its dependency from claim 1, and because Chang does not solve the above note deficiencies of the other references. Further, neither Driskill-Smith nor Jin show the emitter and specimen being separated by less than 200 nm. Further, Jin suggests, if it all, an emitter-specimen separation of at least this order of magnitude and more likely several orders of magnitude greater. In Jin, the gate has a thickness of between 50 nm and 100 nm, (*see col. 12, line 43-44, lines 6-14 and col. 11, lines 1-2*). The insulator has a thickness which is several times greater than the gate thickness. The gate is separated from the anode. Thus, the sum of layer thickness is in the gap suggested by the emitter and the gate are separated by at least 200 nm and more likely by 1 to 100 nm. Furthermore, claim 26 is not obvious because one of skill in the art would not consider combining Driskill-Smith, Jin.

The Office Action rejects claims 19, 21, and 22 under 35 U.S.C. § 103 over Driskill-Smith in view of Jin and further in view of Kruit (USP 5,587,586). This rejection is respectfully traversed.

Claims 19, 21 and 22 are not obvious over the applied references because of the dependency from claim 1, and because Kruit does not solve the above-noted deficiencies Driskill-Smith and Jin.

Furthermore, claim 19 is not obvious because none of the applied references show an aperture with a diameter of less than 50 nm. In particular, in Driskill-Smith the aperture diameter is 50 nm, in Jin the aperture diameter is 50 nm to 100 nm and in Kruit no aperture diameters are given. Furthermore, it is submitted that one of skill in the art would not consider combining teachings from Driskill-Smith and Kruit. In particular, Driskill-Smith and Kruit show very different sources. In Kruit, the emitter and the extractor are not on a common substrate. In fact, it is difficult, if not impossible, to fabricate the source shown by Kruit on a common substrate. Thus, one of skill in the art would consider that the teachings of Driskill-Smith and Kruit are incompatible and thus would not consider Kruit to be relevant. For at least the above reasons, it is submitted that claims 19, 21 and 22 would not have been obvious over the applied references and Applicants request withdrawal of the rejection.

For at least the above reasons, it is submitted the application is in condition for allowance. Prompt consideration and allowance are solicited.


Attached hereto is a marked up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Version with Markings to Show Changes Made**".

The Office is authorized to charge any fees due under 37 C.F.R. § 1.16 or 1.17 to Deposit Account No. 11-0600.

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Should there be any questions concerning this matter, the Examiner is invited to contact Applicants undersigned attorney.

Respectfully submitted,


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